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# Economic evaluation of the market potential of fruit and berry production in the regions of the European North of the Russian Federation

*The article examines regional peculiarities of the local market formation of fruit and berry production in the Russian North from the theoretic perspective of new economic geography. It examines modern market development trends, presents the economic estimation of the market development potential of fruit and berry production in the regions of the European North of the Russian Federation.*

*Region, new economic geography, local market, berry products, the European North of the Russian Federation.*

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Vast areas, different duration and efficiency of economic development, uneven use of the territory's resources is one of the main reasons for Russian territorial differences in the development and distribution of productive forces. Liberalization of economic activities in the 1990s aroused interest in studying the peculiarities of the regional development, in analyzing natural resource potential and the contemporary geopolitical, economic and geographical situation in the territories. In that aspect the understanding of cause-and-effect relations of the country's socio-economic development is of fundamental nature [2] and takes into account different scientific views on the problem of regional development. In general, the main approaches to defining 'region' are territorial-spatial, economic and geographical, reproductive and territorial-administrative[13], moreover, these approaches complement each other in terms of spatial Economics (A.G. Granberg, A.I. Tatarkin, P.A. Minakir, etc.) and the theory of new economic geography (P. Krugman, J. Harris, A. Pred, etc.). Both of these scientific beliefs were formed not long ago (in the past 20–25 years), and has got scientific recognition only in recent years [5].

Paul Krugman's theory of the new economic geography is essentially based on two imperatives – J. Harris' "market potential" and A. Pred's "base-multiplier" model of regional income. It should be highlighted that the market potential concept includes access to all stages of goods flow – production, distribution, exchange and consumption [5].

The models within new economic geography describe the effects of "overjumping", "outstripping". This mechanism explains the phenomenon of leaders change in the periods of radical technological changes, when "the last ones become the first". Technologically and economically underdeveloped countries can take advantage of lower wages in order to reach the market. Moreover, because of their poverty these countries venture to introduce new technology, to take risks. Therefore, it often happens that the very factors enabling the country to become leader at one stage of technological and economic development, impede and hamper its dynamic development at the next stage [10].

Paul Krugman marked out two groups of factors contributing to the realization of the territories' competitive advantages. The "first-order" factors include the availability of natural resources (mineral, land resources, etc.) that are in demand in the market, as well as geographical location, including the position at global trade routes, reducing transport costs and facilitating innovation broadcasting. These advantages exist regardless of people's activity.

The "second order" factors comprise the advantages generated by the activities of an individual and society: agglomeration effect (high population density in cities, which allows for economies of scale); human capital (education, health, labour motivation, population mobility and adaptability); institutions, which contribute to the improvement of the business climate, population mobility, innovation diffusion, etc.; infrastructure, reducing economic distances [7].

Territorial-spatial approach to management, a number of provisions of Paul Krugman's "new economic geography" can be applied the regions of the European North of the Russian Federation as well, particularly the Northern, Northwestern and Arctic territories [5].

The territory of the North of Russia's European part is limited from the South, by parallel $60^0$N on average and practically coincides with southern administrative boundaries of the Pskov ($56^0$N), Novgorod ($58^0$N), Vologda ($59^0$N) oblasts and the Komi Republic ($61^0$N).

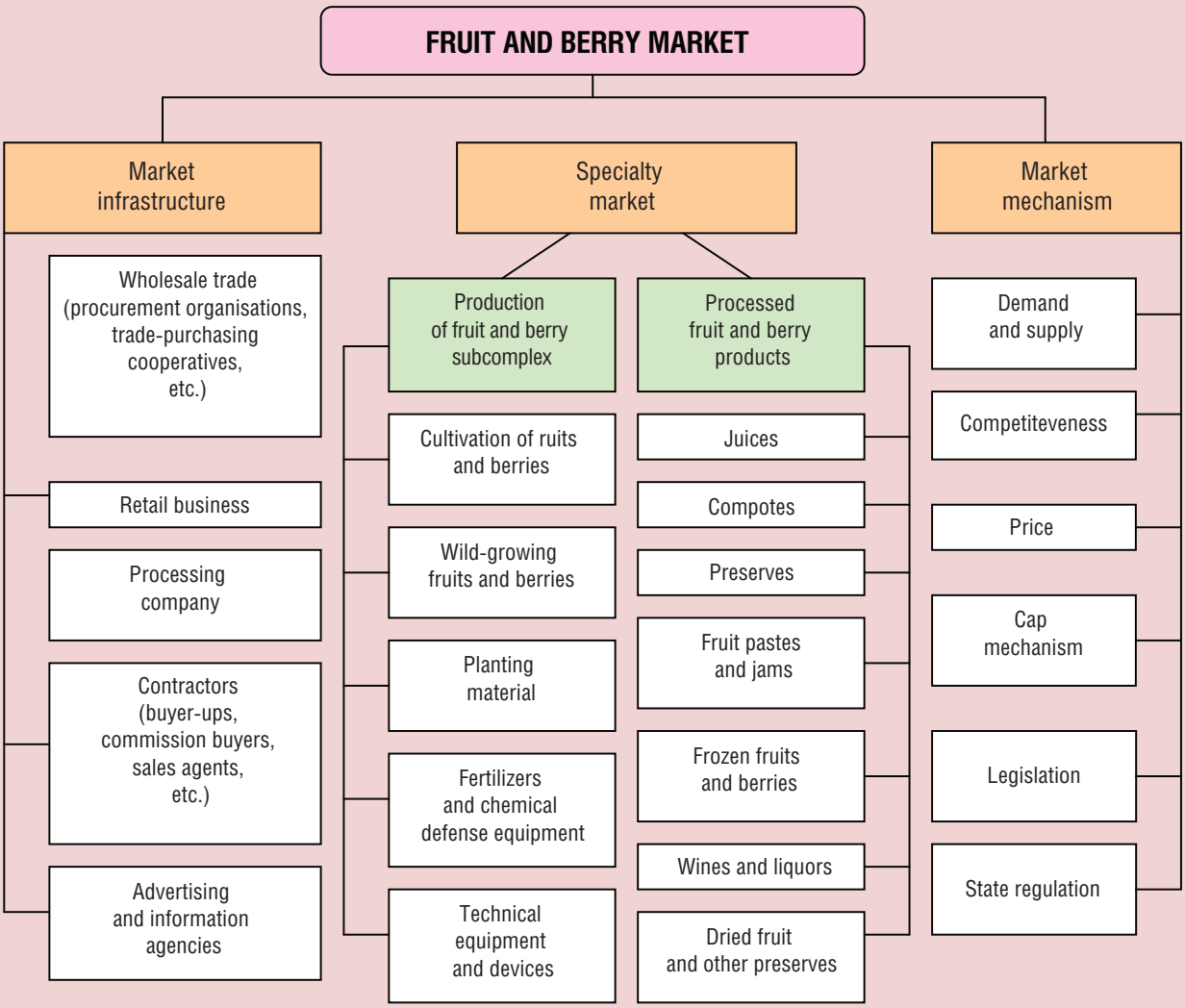
Important factors promoting the territory's economic development from the theoretic perspective of new economic geography and spatial approach include a unique geographical position and climate conditions, determining the regional (local) market development of fruit and berry products.

Research into theoretical and methodological approaches to the market development, including the works [1, 16], suggest that the market of fruit and berry products should be considered as a type of the common food market of multicommodity character, which is explained by a variety of independent markets of certain types of fruit and berry existing within it. According to the authors, fully functioning market of fruit and berry products of the Northern region consists of several components: market infrastructure, specialized markets, market mechanism *(fig. 1)*.

The local berry market is a system of economic relations concerning the implementation of berry products in the merchandise turnover. The object's specifics is that it is presented by two groups: cultivated and wild-growing. The first group of cultivated berries goes through production stage, while the second group of wild-growing berries immediately gets into circulation [9].

Natural-climatic factor directly affects berry growth and cultivation conditions. The variability of the weather regime throughout

Figure 1. Structure of developed market of fruit and berry products (compiled by the authors)




the year, except for the summer period; the prevalence of non-chernozem, low-fertility soils; swampiness of the territory (especially in the North) are the distinctive features of the Northern territories. Biological reserve of major varieties of wild berries alone in the regions of Russia's European North is rather large-scale: 3260 thousand tons of cowberries per year, 1800 thousand tons of blueberries, 640 thousand of bilberries, 1100 thousand tons of cranberries per year. This is a rather substantial and extensive activity field for personal subsidiary plots (PSP) in the field of gathering and processing of wild-growing berries.

Moreover, the territory of Russia's European North, particularly the Vologda Oblast, has significant potential for the distribution and economic turnover organization of cultivated berries

Modern horticulture began to develop in the oblast in 1927 with the creation of a centre of All-Union Institute of Applied Botanics and New Crops that was reorganised in 1932 into the Nikolsky fruit-berry centre within I.V. Michurin Research Institute, and later (December, 1956) became subordinate to Vologda State Agricultural Experimental Station. A number of new types of apple trees,

currant, gooseberry, etc. were produced at the Nickolsky centre (that existed until 1974).

In 1972, Vologda horticulture centre was opened at the Vologda District village Maisky. The works with regard to studying apple trees assortment were conducted here, in order to identify the most productive, winterproof, scab resistant types. The research into the use of polyethylene film for growing black currant seedlings was carried out, various ways and terms of propagation of berry plants, methods of queen cells accelerated reproduction and creation were examined. During functioning of the centre the assortment had been (and is) changing, more productive and yielding cultivars were introduced, the system of cultivating cane fruit mother plantations and commodity plantations at households was created and tested [13].

At present, the enterprise, which is the largest fruit tree nursery in the North-West, introduces new advanced technologies, actively cooperates with the Research Institute of Horticulture of the Nonchernozem Zone. Vologda state variety test plot of fruit and berry crops and Vologda horticulture centre of the All-Russian Selection and Technological Institute of Horticulture and Nursery (SSI ASTIHN) have been operating at the premises of the enterprise. The new cultivars are reproduced and introduced based on long-term cultivar investigation results. Over 1000 varieties of berry and other crops is cultivated in the enterprise.

Such berries as strawberry and black currant are produced predominantly at the integrated agricultural production centre Plemzavod Maisky. In certain years the plemzavod was engaged in the production of raspberry, sea buckthorn, honeysuckle, black chokeberry, and gooseberry. At the same time, their share in the total berry production volume made up 0.1%.

When considering berry sales of the integrated agricultural production centre Plemzavod Maisky, it can be concluded that during the 2005–2011 period the strawberry sales insignificantly decreased, while black currant sales, on the contrary, increased by 36%. In 2011 the enterprise sold 86.7 tons of strawberries and 90.1 tons of black currants. Sales of other berry crops are extremely low *(tab. 1)*.

The indicators of berry profitability, the level of which, except for the black currant profitability, is rather high, allow the economic efficiency of berry crops cultivation to be assessed. In certain years the production profitability of strawberries exceeded 200%, and the production profitability of raspberries reached 150% *(tab. 2)*.

Table 1. Berry sales of APC Plemzavod Maisky, kg

| Berry | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2011 to 2005, % |
|---|---|---|---|---|---|---|---|---|
| Strawberry | 91504 | 64094 | 85126 | 78933 | 125195 | 63526 | 86737 | 94.8 |
| Black currant | 66499 | 12631 | 86091 | 37442 | 56447 | 38294 | 90112 | 135.5 |
| Raspberry | 77 | 44 | 32 | 111 | 236 | 27 | 49 | 63.6 |

Table 2. Profitability level of berries produced at APC Plemzavod Maisky, %

| Berry | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|
| Strawberry | 141,7 | 45,8 | 207,4 | 62,4 | 204,2 | 76,5 | 154,3 |
| Black currant | -1,3 | -61,9 | 86,3 | -1,5 | 144,1 | -28,7 | 6,3 |
| Raspberry | 129,7 | 163,1 | 144,2 | 84,6 | 118,6 | 156,4 | 84,7 |

However, natural low fertility of lands, short vegetation period make for rather low fruit and berry crop yields, and high costs ensuring their economic turnover hinder the extensive development of large horticultural farms. At present only 0.2% of the total fruit and berry production falls on agricultural organizations of Russian European North. Fruit and berry production in the Northern regions of the country is practically focused in dachas and subsidiary plots *(tab. 3)*. Thus, personal subsidiary plots are the main producer of fruit and berry products in Russia's European North.

At the same time, individual subsidiary agricultural production is inhomogenous and includes two forms. The first form is the production at subsidiary or field plots owned by rural residents. The second form is the production at truck patches and dachas by urban residents.

The role of personal subsidiary plots in providing the population with fruit and berry products has significantly increased, due to the transition to market relations and lowering living standard, although the potential of personal subsidiary plots in this field is not used to the full. Their involvement in the sphere of fruit and berry products exchange and in the food market system remains very low. The work of personal subsidiary plots is still considered only as a source of food self-sufficiency. In fact, this category of farms has significant surplus of agricultural products, including fruit and berries. According to the budget surveys of the Vologda Oblast PSPs, personal subsidiary farms currently produce about 20 kg of berry products. Overall production of fruit such as apples is rather significant – in certain years up to 1-1.5 tons per one PSP. Therefore, under favourable conditions of market infrastructure (proximity to the market, transport availability, etc.) the surplus of fruit and berry products could go to the local market.

As follows from the results of the Vologda Oblast population survey, each family can produce on average 1.2 tons of berry products (including wild-growing berries). A total of 200 people participated in the survey. The respondents were distributed by the following expert groups: the population of districts make up 40% of respondents, small and medium-sized enterprises – 50%, financial and credit institutions, organizations of the infrastructure of small and medium-sized enterprises support – 5%, experts in the sphere of small and medium enterprises support and development amount to 5%.

Table 3. Production structure of fruit and berry production in the regions of the European North of the Russian Federation (% of total production volume in households of all categories)

| Territory | Agricultural organizations | | Population households | | Farm households | |
|---|---|---|---|---|---|---|
| | 2005 | 2010 | 2005 | 2010 | 2005 | 2010 |
| Republic of Karelia | 1.2 | 0.3 | 96.7 | 99.4 | 2.1 | 0.3 |
| Komi Republic | 0.0 | 0.0 | 100 | 100 | - | 0.0 |
| Arkhangelsk Oblast | - | 0.0 | 100 | 100 | - | - |
| Vologda Oblast | 1.4 | 1.5 | 98.6 | 98.5 | - | - |
| Kaliningrad Oblast | 0.1 | 0.0 | 99.9 | 100 | - | 0.0 |
| Leningrad Oblast | 0.4 | 0.1 | 99.6 | 99.9 | 0.0 | 0.0 |
| Murmansk Oblast | 0.0 | 0.5 | 100 | 99.5 | 0.0 | - |
| Novgorod Oblast | - | - | 100 | 100 | - | - |
| Pskov Oblast | 3.1 | 1.0 | 96.3 | 99.0 | 0.7 | - |
| NWFD on average | 0.8 | 0.2 | 99.1 | 99.8 | 0.1 | 0.0 |
| For reference: Russia | 20.7 | 15.0 | 78.4 | 82.8 | 0.9 | 2.2 |
| Source: Agriculture, hunting and forestry in Russia. 2011: statistical digest. Rosstat. Moscow, 2011. | | | | | | |

Thus, the potential berry market of Russia's European North is rather well-marked, however, the realization of this potential is largely constrained by underdeveloped market infrastructure at the local level. As a result, the import from other Russian regions and from abroad remains, as before, the main source of fruit and berries on the consumer market of the RF NWFD subjects. Trade liberalization in recent years allowed the import of fruit and berry products to be considerably increased.

Such situation is characteristic throughout the country as well. In the 2000–2011 period the import of fresh apples in Russia increased from 218 thousand tons to 1191 thousand tons respectively, of fresh grapes from 72 thousand tons to 400 thousand tons, of citrus fruits from 473 thousand tons to 1661 thousand tons, and of bananas from 506 thousand to 1308 thousand tons *(tab. 4)*.

State statistics data show that import covers personal consumption of these products by 90–95% in the majority of the RF NWFD subjects. In the Kaliningrad Oblast alone this percentage is lower than in other regions of the district, amounting to 62%. According to our estimations, the population of NWFD consumed more than 1.2 million tons of imported fruits and berries in 2010.

Due to growing import, average per capita fruit and berry consumption in the Northwestern Federal District increased by 25% and amounted to 61 kg per person over the 2006–2011 period *(tab. 5),* which is somewhat higher than the national average.

Table 4. Import of fruit and berry products by the Russian Federation

| Production | 2000 | 2005 | 2008 | 2009 | 2010 | 2011 | 2011 to 2000, % |
|---|---|---|---|---|---|---|---|
| Bananas, thousand tons | 506 | 865 | 1007 | 981 | 1069 | 1308 | 258.5 |
| Citrus fruits, thousand tons | 473 | 953 | 1288 | 1280 | 1491 | 1661 | 351.2 |
| Including: oranges | 250 | 391 | 502 | 444 | 499 | 568 | 227.2 |
| lemons | | | 183 | 206 | 212 | 223 | 121.9* |
| Fresh grapes, thousand tons | 71.7 | 291 | 407 | 375 | 409 | 400 | 557.9 |
| Fresh apples, thousand tons | 218 | 730 | 1064 | 851 | 1206 | 1191 | 546.3 |

* 2011 to 2008, %.
Source: Russian statistical yearbook. 2012: statistical digest. Rosstat. Moscow, 2012.

Table 5. Fruit and berry consumption in NWFD regions (kg per capita annually)

| Territory | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2011 to 2006, % | Ratio | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | To the minimum rate (80 kg/person) | To the optimal rate (120 kg/person) |
| Kaliningrad Oblast | 54 | 58 | 65 | 64 | 70 | 71 | 131.5 | 88.8 | 59.2 |
| Vologda Oblast | 57 | 59 | 65 | 61 | 66 | 68 | 119.3 | 85.0 | 56.7 |
| Murmansk Oblast | 51 | 55 | 60 | 60 | 65 | 65 | 127.5 | 81.3 | 54.2 |
| Saint Petersburg | 48 | 53 | 59 | 59 | 61 | 64 | 133.3 | 80.0 | 53.3 |
| Arkhangelsk Oblast | 50 | 54 | 59 | 59 | 61 | 62 | 124.0 | 77.5 | 51.7 |
| Novgorod Oblast | 44 | 43 | 53 | 54 | 57 | 58 | 131.8 | 72.5 | 48.3 |
| Leningrad Oblast | 45 | 50 | 53 | 52 | 57 | 57 | 126.7 | 71.3 | 47.5 |
| Komi Republic | 37 | 39 | 47 | 49 | 50 | 53 | 143.2 | 66.3 | 44.2 |
| Republic of Karelia | 39 | 42 | 42 | 44 | 47 | 49 | 125.6 | 61.3 | 40.8 |
| Pskov Oblast | 41 | 44 | 46 | 45 | 45 | 48 | 117.1 | 60.0 | 40.0 |
| NWFD on average | 47 | 51 | 57 | 56 | 59 | 61 | 129.8 | 76.3 | 50.8 |
| RF on average | 48 | 51 | 54 | 56 | 58 | 60 | 125.0 | 75.0 | 50.0 |

Source: Consumption of main food products. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1286360627828

However, per capita fruit and berry consumption in the NWFD make up only 76% of the minimum rate (80 kg) and 51% of the recommended rate (120 kg), adopted by the Russian Academy of Medical Sciences. The value of this indicator substantially differs among the subjects of the Russian Federation. So, in the Komi Republic, the Republic of Karelia, the Novgorod, Leningrad and Pskov oblasts, per capita fruit and berry con sumption falls short of the half of the optimal rate (120 kg).

Wild-growing berries are an important reserve for the development of fruit and berry subcomplex and providing the population with berry products. For example, the Vologda Oblast has a huge potential for the development of berry procurement and processing. According to the forest management, the biological reserve of wild-growing berries in the area makes up 56 thousand tons, including cranberries – 37 thousand tons, cowberries – 11.2 thousand tons, blueberries – 7.8 thousand tons. The resources of blueberry, bilberry, strawberry, raspberry, currant and other wild-growing berries have not been nearly examined [19].

According to the Forestry plan, the volume of wild-growing berries procured by forest sector companies is planned to reach 514.3 tons by 2017 *(fig. 2)*. This will make it possible to attract extra 25–30 million rubles to the oblast budget as payment for berries gathering. However, in fact, budget loses significant sums due to poor market infrastructure development.

Over a long period of time, consumer cooperatives with the extensive network of offices in all districts, have been the main regional organization, procuring this type of production. In 1991 the Vologda Oblast consumer's association bought 3.8 thousand tons of cranberries and blueberries, the significant part of which was sold on the country's domestic market and abroad. However, this system has been destroyed. In 2010 the cooperatives purchased only 11 tons of forest berries. Insufficient attention of the state to such activities is one of the reasons for the under-utilization of the reserve increase [19].

Figure 2. Procurement volume of wild-growing berries in the Vologda Oblast, tons

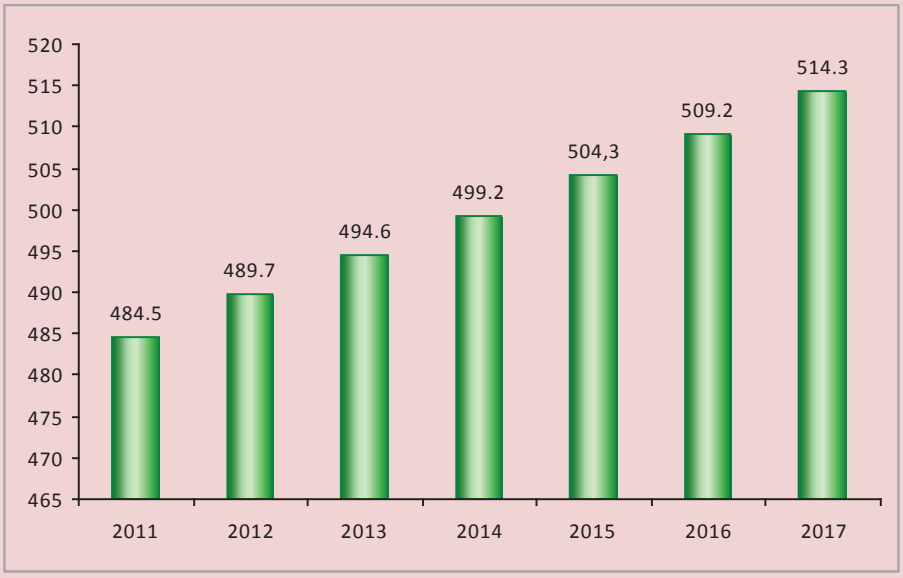
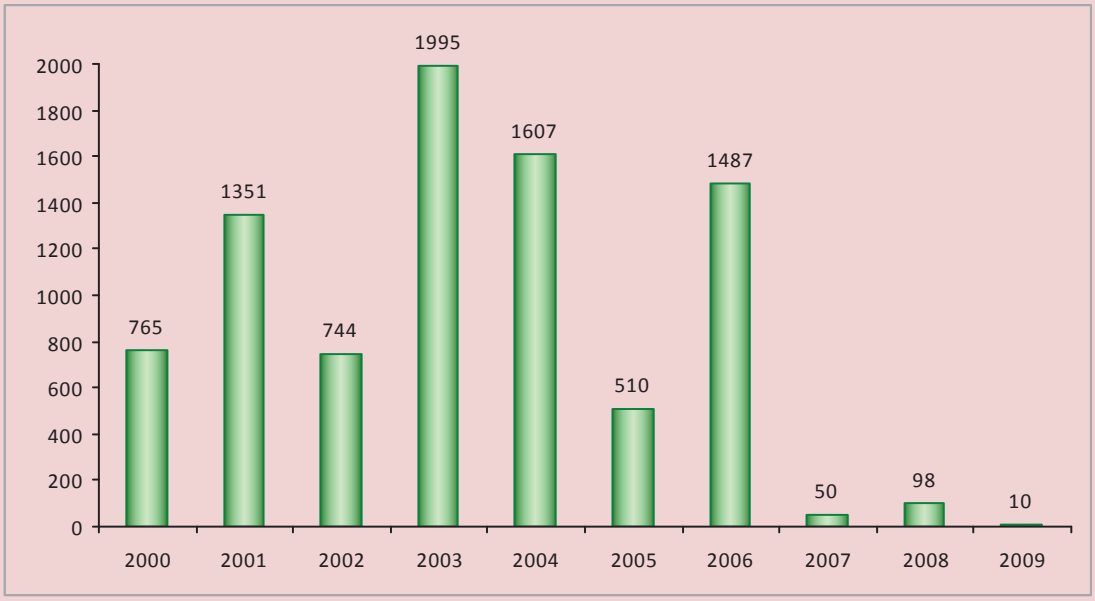


Figure 3. Export dynamics of wild-growing berries in the Vologda Oblast, tons




However, foreign demand for wild-growing berries is characterized by the tendency of steady increase, and regions that supply berry products for export, receive quite sufficient income. Thus, the Vologda Oblast exported 8617 tons of berry products for the 2000–2009 period *(fig. 3)*. Unfortunately, state statistical authorities do not provide any information about the export volume of wild-growing berries in the Vologda Oblast in recent years. However, as follows from print materials, the effectiveness of this activity has been increasing. Thus, 464 tons of berries (blueberry, cowberry, cranberry) with the total cost of 1.3 million US dollars were exported for the nine months of 2012[1].

At the same time, as a result of the state's withdrawal from the sector and the emergence of new channels of production flow, the role of which has been rapidly increasing, the tendency of decreasing export volume can be observed. Thus, along with forestry enterprises, the yields of which have significantly reduced, a lot of entrepreneurs and commercial companies, i.e. contractors (buyer-ups) became the suppliers of wild-growing forest food products.

At the same time, a great number of private companies and buyer-ups, cooperating with exporters and the capital's retailer, emerged in the market of wild-growing berries in the region.

The experience in using the resources of wild-growing berries in other NWFD regions has been accumulating as well; marketing activities on expanding the presence in the domestic and foreign markets constitute an important part of this business. Direct investments from the concerned Swedish, Finnish and Norwegian companies have become to a significant extent the stimulus to procurement development in the Republic of Karelia, the Pskov, Arkhangelsk and other oblasts. The sources of foreigners' interest are clear: this Russian region is in close proximity

[1] Vologda Oblast exports berries and mushrooms for millions of US dollars. Available at: http://www.krassever.ru/articles/economics/monitoring/38400/

to the borders of the countries, in which the consumption of wild crops (primarily berries) is at a very high level. In fact, the companies traditionally engaged in the processing of wild-growing berries, seriously took up relatively cheap Russian commodity market. At present, up to 40 companies in Karelia are involved in harvesting and supplying wild crops to the countries of Northern Europe. They are fully financed by Western partners. But processing of wild-growing primary products was not developed in the region: the vast majority of the market operators gather and supply berries for export "as is".

Note, that the effective functioning of the local berry market largely depends on the state regulation. However, as follows from the study, the priorities of state support for the industry are not clearly defined at both country and regional levels; the state regulation mechanism of prices for fruit and berry products and goods necessary for its production remains imperfect and is practically not regulated by imported fruit and berry volume; there is no information on the status and changes of the world fruit market. The development potential of fruit and berry subcomplex by means of wild crops remains unrealized. Up to now, government institutions have failed to organise gathering of wild-growing berries.

According to the authors, an increase in the efficiency of berry resources use is an important reserve for socio-economic development of the regions of Russia's European North and for the improvement in the population life quality. The use of this reserve depends directly on the development of the local market of fruit and berry products.

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